Skip to Main Content

271-Article_Text-1120-1-10-20191210.pdf

by

FILE	271-ARTICLE_TEXT-1120-1-10-20191210.PDF (445.83K)		
TIME SUBMITTED	17-DEC-2019 03:47PM (UTC+0700)	WORD COUNT	3713
SUBMISSION ID	1235927892	CHARACTER COUNT	18976

FACTORS RELATED WITH CONSTRUCTION WORKERS WORK FATIGUE AT MAKASSAR CITY HIGHWAY

Syamsiar S Russeng[1], Lalu Muhammad Saleh[1], Ummu Khaerat Rahmawan[1]
[1]Department of Occupational Safety and Health, Faculty of Public Health, Hasanuddin University, Indonesia.

ABSTRACT

Fatigue can be experience by everyone. However these are factors associated with work fatigue such as Age, workload, length of work, work period, and nutritional status. This study aims to determine the relationship of age, workload, length of work, years of service, and nutritional status with fatigue of workers in highway projects at PT. Wijaya Karya Beton. This research approach is an observational analytic with a cross sectional study. Data collection was conducted from March 2019 until April 2019 with respondents 63 workers taken with a proportionate stratified random sampling technique. Data obtained by using questionnaires, nutritional status using scales and microtoice, workload using digital tension. The results showed that workers who experienced fatigue were 66.7% and 33.3% of workers did not experience fatigue. The relationship between workload (p = 0.004), length of work (p = 0.040), and nutritional status (p = 0.015) with work fatigue. Furthermore, author's advice for workers is to use optimal rest time so that the work fatigue can be reduced, and also consume an optimal food for energy intake.

Keywords: Work fatigue, Construction Workers, Highway

INTRODUCTION

There is an interesting phenomenon that is owned by the construction industry, namely firstly that the construction industry service is an industry that has a considerable risk, but can be minimized by the existence of occupational safety and health programs through the establishment of work culture, one of which is occupational safety and health culture. In carrying out their work each worker is at risk of getting work accidents and occupational diseases. Work accidents and diseases are usually preceded by disruption of comfort, health problems and decreased work productivity. One of the health problems that can precede accidents and occupational diseases is the emergence of work fatigue.

Work fatigue is often interpreted as a process of decreasing performance, effectiveness and efficiency as well as reduced strength and endurance to continue to do a job. Declining performance by workers automatically makes the company's productivity also declined. Fatigue is a problem that must receive special attention in all types of work (Tarwaka, 2014). Japan shows the number of deaths of workers who died due to work fatigue (karoshi) in the past year reached 1,456 cases, setting the highest record so far based on data from the Ministry of Health, Labor and Welfare of Japan (Demetriou, 2016). Data on work accidents published by the Indonesian National Police in 2012 in Indonesia every day an average of 847 work accidents occur daily. 36% due to fatigue is quite high. Tired less than 18% or 152 people have disabilities (Rahayu, 2017). The International Labor Organization mentions that nearly two

million workers die every year due to work accidents caused by fatigue. The study stated that of 58,115 samples, 32.8% of them or around 18,828 samples suffered from fatigue (ILO, 2013).

Work accidents in Indonesia due to unsafe labor behavior reached 31,776 cases (32.06%) of the total cases during 2009 which included the fatigue of workers at work and others, including undisciplined use of personal protective equipment. Thus, it can be concluded that the main factors causing work accident include unsafe behavior and unsafe conditions (Jamsostek, 2010). Work fatigue in tofu factory workers in Mamajang sub-district of Makassar city in 2016 showed a relationship between work period and work fatigue. The results of this study indicate that overall workers with long working periods experience fatigue, as many as 18 people. Workers with new tenure also experienced fatigue of 12 workers (75.0%) (Pasira, 2016).

Construction work is a type of heavy work. This job uses more physical strength and extra energy, so workers have the potential to experience fatigue. If fatigue is often experienced can result in work accidents. This study is also in line with the results of research conducted by Setiawan (2018) which shows that workers who experience fatigue in the category of light workload are 32 workers (71.1%) and in the category of heavy workloads that is 27 workers (93.1%). Statistical test results obtained the value of $p = 0.036$ ($p < 0.05$) which means there is a relationship between workload and work fatigue in construction workers at the Nipah Mall Makassar project in 2017 (Setiawan, 2018).

Results of observations on construction workers on the A.P. street location Pettarani Kota Makassar found that the number of field workers working on the project was 171 field workers. Each worker has their respective duties based on the work unit they occupy, when conducting initial interviews in the field with the workers, some workers complain of fatigue, headaches and pain in some parts of the body, as well as several individual factors such as age, workload, length work, work period and nutritional status so that it can cause fatigue so that the authors are interested in doing research on this project due to seeing the conditions of existing workers in the field. Based on the description above, the authors are interested in conducting research on factors related to work fatigue in the flyover construction workers A.P. Makassar City Pettarani.

METHODOLOGY

This type of research is analytic observational with cross sectional study approach. This research was carried out in the PT. Wijaya Karya Beton Makassar City in March 2019 - April 2019. The population is 171 people. The number of samples of 63 people were taken by proportionate stratified random sampling technique. Data obtained from respondents using questionnaires, scales and microtoice to get nutritional status data, digital tension to get workload data. Data analysis performed was univariate and bivariate using the chi square test and the results were presented in tables and narratives.

RESULTS

Table 1. Distribution of Respondents based on Independent Variables with Dependent Variables in Road Construction Project Workers PT. Wijaya Karya Concrete Makassar City

Variable	n = 63	%
Age		
Old (> 30 years old)	28	44,4
Young (≤ 30 years Old)	35	55,6
Workload		
Weight (<100 beats / minute)	41	65,1
Light (> 100 beats / minute)	22	34,9
Length of working		
Not meeting (> 8 hours / day)	29	46
Meet (≤ 8 hours / day)	34	54
Years of service		
Old (> 3 years)	4	6,3
New (<3 years)	59	93,7
Nutritional status		
Abnormal (<18.5 kg / m2 -> 25.0 kg / m2)	36	57,1
Normal (18.5 kg / m2 - 25.0 kg / m2)	27	42,9

Source: Primary Data, 2019

The results showed that the age of respondents who worked on the A.P Petarani flyover construction project in Makassar City ranged from 19-54 years with 28 respondents aged old (44.4%) and 35 young people (55.6%). The distribution of respondents based on workload is obtained by a heavy workload of 41 respondents (65.1%), while respondents who have a light workload are 22 respondents (34.9%) (Table 1).

While the length of work of respondents who worked on the road construction project of PT. Wijaya Karya Concrete Makassar City ranges between 8-12 hours / week. obtained by respondents who have long worked does not meet the requirements of 29 people (46%), while respondents who have worked long have met the requirements of 34 people (54%). The working period of respondents who worked on PT. Wijaya Karya Concrete Makassar City ranges from 1-5 years. Respondents who have a

long working status are 4 people (6.3%), while respondents who have a new work status are 59 people (93.7%). The distribution of respondents based on nutritional status is obtained by respondents with abnormal nutritional status as many as 36 people (57.1%), while respondents who are of normal status are as many as 27 people (42.9%) (Table 1).

Table 2. Relationship of Independent Variables with Dependent Variables on Workers in PT. Wijaya Karya Concrete Makassar City

Independent Variable	Work Fatigue						Statistical Test Result
	Tired		Not Tired		Total		
	n	%	n	%	n	%	
Age							
Old	18	64.3	10	35.7	28	100.0	p=0.929
Young	24	68.6	11	31.4	35	100.0	
Workload							
Weight	33	80.5	8	19.5	41	100.0	p=0.004
Light	9	40.9	13	59.1	22	100.0	
Length of working							
Does not meet	15	51.7	14	48.3	29	100.0	p=0.040
Meet	27	79.4	7	20.6	34	100.0	
Years of service							
Long	4	100.0	0	0.0	4	100.0	p=0.292
New	38	64.4	21	35.6	59	100.0	
Nutritional status							
Abnormal	29	80.6	7	19.4	36	100.0	p=0.015
Normal	13	48.1	21	33.3	21	100.0	

Source: Primary Data, 2019

The results of bivariate analysis showed that more work fatigue was experienced by young respondents, namely 24 respondents (68.6%), compared to only 18 respondents (64.3%) who experienced work fatigue at the age of the old category. The results of data analysis using the Chi Square test obtained p value = 0.929 (p> 0.05), this means that H0 is accepted and Ha is rejected. So it can be concluded that age has no relationship with work fatigue in road construction project workers at PT. Wijaya Karya Concrete Makassar City (Table 2).

The results of the bivariate analysis showed that work fatigue experienced by workers in the heavy workload category was 33 respondents (80.5%) and work fatigue was in the light category as many as 9 respondents (40.9%). The results of data analysis using the chi-square test obtained p value = 0.004 (p <0.05), this means that H0 is rejected and Ha is accepted, so it can be concluded that workload has a relationship with work fatigue in PT. Wijaya Karya Concrete Makassar City. (Table 2).

The results of the analysis of the relationship between work time and work fatigue. Shows that workers who experience work fatigue in the long work category do not qualify as many as 15 respondents (51.7%) and the category qualifies as many as 27 respondents (79.4%). The results of data analysis using the chi-square test obtained p value = 0.040 (p <0.05), this means that H0 is rejected and Ha is accepted, it can be concluded that the length of work has a relationship with work fatigue in PT. Wijaya Karya Concrete Makassar City (Table 2).

The results of the analysis of the relationship of work tenure with work fatigue showed that workers who experienced work fatigue with the category of long work less were 4 respondents (100.0%) compared to workers who experienced work fatigue with the new work tenure category of 38 respondents (64.4%). The results of data analysis using the chi-square test obtained p value = 0.292 (p> 0.05), this means that H0 is accepted and Ha is rejected, so it can be concluded that the working period has no relationship with work fatigue at PT. Wijaya Karya Concrete Makassar City (Table 2).

The results of the analysis of the relationship of nutritional status with work fatigue showed that workers who experienced work fatigue with abnormal nutritional status categories were 29 respondents (80.6%) compared to workers who experienced work fatigue with normal nutritional status categories of 13 respondents (48.1%). The results of data analysis using the chi-square test obtained p value = 0.015 (p <0.05), this means that H0 is rejected and Ha is accepted, so it can be concluded that nutritional status has a relationship with work fatigue in PT. Wijaya Karya Concrete Makassar City (Table 2).

Of the 63 respondents, workers who experienced work exhaustion in the category of work units in the Bauer unit were 15 respondents (51.7%), foreman units were 13 respondents (81.3%), formwork units were one respondent (50%), sapling units were one respondent (50%), unit loading / unloading by one respondent (50.0%), operator units by four respondents (100.0%) and helper units by seven respondents (77.8%).

DISCUSSION

Work fatigue is a subjective feeling. Everyone has a different perception in interpreting fatigue so it is difficult to measure. Fatigue is a subjective state or feeling, fatigue is difficult to measure directly because each person has a different view in explaining his feelings of fatigue.

Fatigue is a mechanism of body protection so that the body is protected from further damage. Therefore, the concerned needs to rest so that recovery can occur. Fatigue is usually felt at the end of working hours (Russeng, 2009). Fatigue is a common complaint in the general public and in the working population. In workers, about 20% have symptoms of work fatigue. Work fatigue can be characterized by decreased work performance or all conditions that affect all organism processes, including several factors such as feelings of fatigue (subjective feeling of fatigue), decreased motivation, and decreased mental and physical activity (Setyowati, 2014).

This study interviewed 63 field workers on the A.P Pettarani flyover construction project in Makassar City. In this study, respondents experienced more fatigue than those who were not tired due to factors of age, workload, length of work, years of service, and nutritional status. Age of workers in PT. Makassar City's Concrete Wijaya Karya in this study more young than old age. But the level of fatigue in old and young workers is almost the same.

Age in this study was divided into 2 categories, namely the age category if the respondent was over 35 years old and the young age category if the respondent was 35 years old and below. Based on observations on the road project of PT. Wijaya Karya Beton Makassar City was found that most of the workers were under 35 years old. The results of this study indicate there is no relationship between age and work fatigue because in the construction project on the toll road, the type of work that exists tends to be heavy work. Workers who are classified as old and young are required to do the work that exists. This is due to the dependence of workers with construction projects where from the results of the work they can meet their daily needs. a person's age is directly proportional to the physical work capacity to some extent. Furthermore, there is no relationship between age and work fatigue due to peak muscle strength in men and women around the age of 25-35 years. At the age of about 50-60 years muscle strength decreases by around 15-25 percent and is balanced by the experience and mental maturity of the worker (Setyawati, 2010).

Based on this study it was found that workers who experienced work fatigue for the workload category showed that workers who experienced work fatigue in the heavy workload category were more than workers who had light workload. The results of this study indicate that there is a relationship between workload and work fatigue. Workers in construction projects are classified as jobs that rely on physical strength in carrying out their work. Workers have a heavy workload and a large responsibility, they are required to complete the work quickly and on target. The sensitivity of the pulse to changes in loading that the body receives is quite high. The pulse rate will change in time with changes in loading, whether it comes from mechanical, physical or chemical loading (Tarwaka & Sudiajeng, 2004).

Based on this study found that the length of work with work fatigue variables found that workers who experience fatigue in the long work category are more qualified than the length of work not eligible. Workers are required to work as much as possible in a day even though workers must work beyond normal working hours. Even the work done is a tough type of work. Workers who have abnormal or normal length of work will easily experience fatigue due to heavy workload factors. All workers experience fatigue due to workers having hours of work in a risky day that is> 8 hours, although not all workers have working hours at risk, but construction workers do most of the work manually, repeatedly and overwork their work attitudes, resulting in workers prone to fatigue (Hastuti, 2015). Someone who works well is influenced by the length of work, where physical ability will gradually decline with increasing work period due to fatigue from work and can be aggravated if the physical work of workers

does not do variations in work. Long work will cause contraction of the abdominal buffer muscles continuously for a long time (Suma'mur, 1996).

The working period of respondents in this study are grouped into 2 categories, namely the long work period if the worker has worked 3 years or more and only if the work period is under 3 years. Based on the results of a bivariate analysis between work tenure and work fatigue, workers who experience work fatigue in the new work tenure category are more than workers who experience fatigue in the long tenure category. The working period is not related to this study because the characteristics of the project are always moving and depend on existing projects, so workers in this construction are not fixed they are contracted based on the construction period underway. On average these construction workers work as farmers or their laborers working on this project to supplement their incomes to make ends meet. Length of service can affect workers both positively and negatively. Positive influence will be obtained if the longer a person works, the experience will be in doing his work. Conversely, it will have a negative effect if the workers work longer will cause fatigue and boredom (Boediono, 2003).

Based on this study it was found that the nutritional status and work fatigue variables were found that workers who experienced fatigue in the category of abnormal nutritional status more than workers who experienced fatigue in the normal nutritional status category. The elevated toll road construction worker A.P Pettarani found that most workers did not eat breakfast before work so that workers did not get energy intake. Workers only get enough or optimal energy intake during the day and in the afternoon. Besides work fatigue can occur because respondents who have abnormal nutritional status work a lot with heavy workloads. If the calorie intake of labor does not meet their needs whether it is less or excessive, the labor will experience fatigue more quickly compared to workers with adequate calorie intake (Cicih, 1996). Fatigue is the body's protective mechanism to avoid further damage. Work fatigue is influenced by several very complex factors including nutritional status (malnutrition), health conditions, lack of sleep and so on (Russeng, 2009). The problem of malnutrition or over nutrition in adults is an important problem. This is because it can affect work productivity. Therefore, monitoring of the situation needs to be done continuously. One way is to maintain an ideal or normal weight (Russeng, 2009).

CONCLUSION

This study concluded that there were 66.7% of workers who experienced work fatigue and as many as 33.3% who did not experience work fatigue. It is found that there is a relationship between workload ($p = 0.004$), length of work ($p = 0.040$), and nutritional status ($p = 0.015$) and age ($p = 0.929$), work period ($p = 0.292$) with work fatigue in workers PT. Wijaya Karya Concrete Makassar City. The author's advice to workers is that workers should stretch their muscles between work or at rest, with the aim that blood circulation remains smooth to all members of the body so that the body is not too rigid so that it can cause workers to get tired more quickly, and workers can take advantage of breaks as optimal as possible so that the perceived work fatigue can be reduced.

REFERENCES

Boediono, A. M. (2003). *Penyakit Akibat Kerja.* Semarang: Badan Penerbit Universitas Diponegoro.

Cicih, D. (1996). *Kebutuhan Asupan Kalori Pekerja*. Jakarta: Universitas Indonesia Press.

Demetriou, D. (2016). *Death From Overworking, Claims Hit Record High In Japan*. Tokyo: The Telegraph.

Hastuti, D, D. (2015). *Hubungan Antara Lama Kerja Dengan Kelelahan Pada Pekerja Konstruksi di PT. Nusa Raya Cipta Semarang*. Thesis, Universitas Negeri Semarang.

ILO. (2013). *Internasional Labour Organization. Keselamatan dan Kesehatan Kerja di Tempat Kerja.* Jakarta: Internasional Labour Office.

Jamsostek (2010). *Sebanyak 8,3 Juta Jiwa Mengalami Kecelakaan Kerja*. Available from: http://www.jamsostek.co.id

Pasira, D. (2016). *Faktor Yang Berhubungan Dengan Kelelahan Kerja Pada Pekerja Pabrik Tahu Di Kecamatan Mamajang Kota Makassar Tahun 2016*. Unhas Repository Publication. Makassar: Universitas Hasanuddin.

Rahayu, R. (2017). *Gambaran Kelelahan Kerja pada Petani Rumput Laut di Kecamatan Pa'jukukang Kabupaten Bantaeng*. Thesis, Makassar: Universitas Islam Negeri Alauddin.

Russeng, S. S. (2009). *Status Gizi dan Kelelahan Kerja (Kajian pada Pengemudi Bus Malam di Sulawesi Selatan dan Barat)*. Universitas Hasanuddin. Dissertation. Makassar: Universitas Hasanuddin.

Setiawan, M. A. (2018). *Faktor Yang Berhubungan Dengan Kelelahan Kerja Pada Pekerja Konstruksi Proyek Nipah Mall Kota Makassar Tahun 2017*. Unhas Repository Publication. Makassar: Universitas Hasanuddin.

Setyawati, L, M. (2010). *Selintas Tentang Kelelahan Kerja*. Yogyakarta: Amara.

Setyowati, D. L., Shaluhiyah, Z., & Widjasena, B. (2014). Penyebab kelelahan kerja pada pekerja mebel. Kesmas: *National Public Health Journal, 8*(8), 386-392.

Suma'mur. (1996). *Hygene Perusahaan Dan Kesehatan Kerja*. Jakarta: Cv Gunung Agung.

Tarwaka, B. (2014). *Ergonomi Industri: Dasar-Dasar Ergonomi dan Implementasi di Tempat Kerja.* Surakarta: Harapan Press.

Tarwaka, S., & Sudiajeng, L. (2004). *Ergonomi untuk keselamatan, kesehatan kerja dan produktivitas*. UNIBA, Surakarta.

271-Article_Text-1120-1-10-20191210.pdf

ORIGINALITY REPORT

%15	%8	%4	%10
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Universitas Airlangga Student Paper	%3
2	repo.iain-tulungagung.ac.id Internet Source	%2
3	journal.umy.ac.id Internet Source	%1
4	Piyush Vashistha, Juginder Pal Singh, Pranav Jain, Jitendra Kumar. "Raspberry Pi based voice-operated personal assistant (Neobot)", 2019 3rd International conference on Electronics, Communication and Aerospace Technology (ICECA), 2019 Publication	%1
5	Carlos Carvalho, Sara Paiva. "Potentiate Social Inclusion through Detecting Illegal Parking in Places for Disabled People", International Journal of Information Systems and Social Change, 2018 Publication	%1
	Submitted to iGroup	

6	Student Paper	%1
7	repository.unhas.ac.id Internet Source	%1
8	e-journal.unair.ac.id Internet Source	%1
9	ojs.umsida.ac.id Internet Source	<%1
10	akademik.unsoed.ac.id Internet Source	<%1
11	acrabstracts.org Internet Source	<%1
12	media.neliti.com Internet Source	<%1
13	journal.unsil.ac.id Internet Source	<%1
14	digilib.uns.ac.id Internet Source	<%1
15	Ardeshir Raihanian Mashhadi, Aditya Vedantam, Sara Behdad. "Investigation of consumer's acceptance of product-service-systems: A case study of cell phone leasing", Resources, Conservation and Recycling, 2019 Publication	<%1

16	Submitted to Udayana University Student Paper	<%1
17	Submitted to Caledonian College of Engineering Student Paper	<%1
18	Submitted to Universiti Putra Malaysia Student Paper	<%1

EXCLUDE QUOTES	ON	EXCLUDE MATCHES	< 5 WORDS
EXCLUDE BIBLIOGRAPHY	ON		